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     (FILE 'HOME' ENTERED AT 06:34:09 ON 23 JAN 2003)
     FILE 'CA' ENTERED AT 06:34:18 ON 23 JAN 2003
L1   2237 S MICROPIPET? OR (MICRO OR NANO)(1A)(PIPET? OR DISPENS?) OR NANOPIPET?
           OR MICRODISPEN? OR NANODISPEN?
L2    140 S L1(3A)(ARRAY OR PLURAL? OR MULTI?)
L3     21 S L1(5A)(SYRINGE OR POSITIVE DISPLAC?)
L4   1829 S MICROLITER OR NANOLITER OR(MICRO OR NANO)(A)(L OR LITER)
L5     68 S L4 (5A)(PIPET? OR DISPENS?)
L6     42 S L1 AND L4
L7    255 S L2-3,L5-6
L8    226 S L7 NOT PY>2000
L9     11 S L7 NOT L8 AND PATENT/DT
L10   218 S L8 NOT(PIEZO? OR INKJET OR INK JET OR PRINTER)
L11   229 S L9-10

=> d bib,ab 1-229 l11

L11  ANSWER 9 OF 229  CA  COPYRIGHT 2003 ACS
AN   135:164257  CA
TI   Microdispensing and nanovial arrays provide rapid automated protein/peptide
     identification using MALDI-TOF MS
AU   Ekstrom, Simon; Nilsson, Johan; Marko-Varga, Gyorgy; Laurell, Thomas
CS   Dept. Electrical Measurements, University of Lund, Lund, 221 00, Swed.
SO   JALA (2000), 5(6), 90-92
AB   The combination of silicon micromachined anal. tools and matrix-assisted
     laser desorption/ionization time-of-flight mass spectrometry (MALDI-TOF-MS)
     is ideal for the rapid automated anal. of proteins and peptides.  An expt.
     was conducted which showed that the use of this automated sample prepn.
     step allowed lower std. deviations compared to manual prepn.  Thus, the
     combination of microdispensing and nanovial arrays opens up the possibility
     to perform high throughput anal. of peptides/proteins by MALDI-TOF-MS.

L11  ANSWER 13 OF 229  CA  COPYRIGHT 2003 ACS
AN   133:262250  CA
TI   High-throughput gene cloning and phenotypic screening using robotic sample
     preparation and automated analysis of hybridization assays
IN   Jain, Sarita K.
PA   Pangene Corporation, USA
SO   PCT Int. Appl., 68 pp.
PI   WO 2000056872     A2   20000928       WO 2000-US7626   20000322
     WO 2000056872     A3   20001228
PRAI US 1999-125536P   P    19990322
AB   The invention relates to the use of high-throughput methods for gene
     targeting, recombination, phenotype screening and biovalidation of drug
     targets utilizing enhanced homologous recombination (EHR) techniques.  The
     method uses the recombination between a sequence and a probe labeled with a
     capture moiety to label the gene.  The gene can then be isolated using the
     capture moiety.  These methods utilize robotically driven multichannel
     pipetters to perform liq., particle, cell and organism handling,
     robotically controlled plate and sample handling platforms, magnetic probes
     and affinity probes to selectively capture nucleic acid hybrids, and
     thermally regulated plates or blocks for temp. controlled reactions.

L11  ANSWER 14 OF 229  CA  COPYRIGHT 2003 ACS
AN   133:249314  CA
TI   Microreactor systems and methods for performing reactions in an unsealed
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environment
IN Becker, Thomas; Koster, Hubert; Cantor, Charles R.
PA Sequenom, Inc., USA
SO PCT Int. Appl., 95 pp.

PI	WO 2000056446	A1	20000928	WO 2000-US6288	20000310
	US 6225061	B1	20010501	US 1999-266409	19990310
	US 6485913	B1	20021126	US 2000-678620	20001002
PRAI	US 1999-266409	A1	19990310		

AB An open microreactor system is described for performing a sub-microliter reaction. The open system can contain a solid support having a target site for performing the reaction; a liq. **dispensing** system such as a **nanoliter dispensing pipet** for **dispensing** a sub-**microliter** amt. of a liq. to the target site; a temp. control device for regulating the temp. of the support; and means for controlling the amt. of liq. dispensed, which corresponds to the amt. of liq. that evaps. from the target site. The support can be a (functionalized) bead, pin, comb, wafer, well or microchip. The reaction can include nucleic acid amplification, combinatorial library synthesis, biopolymer sequencing or primer oligo base extension (PROBE).

L11 ANSWER 18 OF 229 CA COPYRIGHT 2003 ACS
AN 132:331472 CA
TI Implementation of **nanoliter dispensing** in the laboratory
AU Bulow, Sven
CS Eppendorf-Netheler-Hinz GmbH, Hamburg, D-22339, Germany
SO GIT Labor-Fachzeitschrift (2000), 44(4), 396,398-399
LA German
AB The nL dispenser Nanozyme is described for a reliable and reproducible dosage of vols. ≥10 nL giving its principle and main application fields.

L11 ANSWER 22 OF 229 CA COPYRIGHT 2003 ACS
AN 132:139149 CA
TI Fully automated membrane **dispensing** in **nanoliter** scale and its application in sensor manufacturing
AU Joergensen, Corinna; Kuennecke, Wolfgang
CS TRACE Biotech AG, Braunschweig, Germany
SO Proceedings of SPIE-The International Society for Optical Engineering (1999), 3857(Chemical Microsensors and Applications II), 207-214
AB The rising degree of miniaturization in sensor technol. and the efforts to make industrial use of it require an adequate soln. for coating of sensors with membranes needed for various applications. A fully automated dispensing device was developed which is capable of **dispensing** droplets in **nanoliter** range with high accuracy and reproducibility. The device combines a three axles positioning system with a pattern recognition system and a dispensing value and is suited for industrial mass prodn. of sensors. Up to 150 droplets per min are possible. Positioning accuracy is below three micrometer and std. deviation of the dispensing process is 2% or lower. The reproducibility of the process is independent from properties of the medium to be dispensed such as viscosity or solvent and shows no dependence on dispensing parameters such as needle diam. or dispensing time. The measurement of dissolved oxygen in a liq. soln. serves as application example to show the practical suitability of the dispensing device.

L11 ANSWER 27 OF 229 CA COPYRIGHT 2003 ACS
AN 131:13147 CA
TI Stamped pipet array for precise and reproducible sample introduction especially for electrophoresis

IN Brophy, John M.; Price, West L.; Jeffs, Joseph
PA Sorenson Bioscience Inc., USA
SO Fr. Demande, 20 pp.

PI	FR 2769246	A1	19990409	FR 1998-11869	19980923
	US 6103198	A	20000815	US 1997-935469	19970924
	GB 2329599	A1	19990331	GB 1998-20630	19980922
PRAI	US 1997-935469	A	19970924		

AB A stamped pipet array, esp. for sample introduction for electrophoresis measurements, consists of many interconnected hollow pipet bodies disposed and oriented parallel to each other and aligned side-by-side, each body of which has a flattened tip extending away from the body. The flattened tips are oriented to each other to form a coplanar array that can permit simultaneous introduction of sample (i.e., the contents of the pipet bodies and the tips) onto the surface of the anal. (electrophoresis) gel plate. The array is esp. suitable for precise and reproducible sample introduction in the electrophoresis of proteins, DNA, and RNA.

L11 ANSWER 33 OF 229 CA COPYRIGHT 2003 ACS
AN 130:47042 CA
TI MultiPROBE nL complements drug discovery assay miniaturization
AU Driscoll, Jennifer; Delmendo, Ron; Papen, Roeland; Sawutz, David
CS Small Molecule Chemistry, Amgen, Inc., Thousand Oaks, CA, 91320, USA
SO Journal of Biomolecular Screening (1998), 3(3), 237-239
AB The Packard MultiPROBE nL is designed to enable the MultiPROBE Automated Liq. Handling System to aspirate and **dispense nanoliter** vols. Several features add confidence to small vol. transfers. A preview of **nanoliter dispensing** can be seen on a video camera monitor. In addn. to the std. wash station, syringe and ultrasonic flushes can be run at the start of a program to prevent dirt or air obstructions. The MultiPROBE nL can transfer ionic, nonionic, and solns. contg. org. solvents such as DMSO directly from master to assay plates and into high-d. plate arrays. Addnl., the MultiPROBE nL increases the efficiency of generating dose response curves for secondary screening by eliminating a diln. step. IC50 values obtained after compd. prepn. with the instrument are consistent with those values previously detd. using an MultiPROBE 208.

L11 ANSWER 34 OF 229 CA COPYRIGHT 2003 ACS
AN 129:341340 CA
TI Verification of multichannel liquid dispenser performance in the 4-30 μL range by using optical path length measurements in microplates
AU McGown, Evelyn L.; Schroeder, Kirk; Hafeman, Dean G.
CS Molecular Devices Corporation, Sunnyvale, CA, 94089, USA
SO Clinical Chemistry (Washington, D. C.) (1998), 44(10), 2206-2208
AB A recent reported method for verifying multichannel pipettor performance by a spectrophotometric procedure that utilizes the near IR absorbance of water has been improved by using half-area microplates and an incremental pipetting method. Thus dispense vols. of 4 μL or less can be accommodated.

L11 ANSWER 37 OF 229 CA COPYRIGHT 2003 ACS
AN 129:104860 CA
TI Reproducible and efficient murine CNS gene delivery using a microprocessor-controlled injector
AU Brooks, Andrew I.; Halterman, Marc W.; Chadwick, Christopher A.; Davidson, Beverly L.; Haak-Frendscho, Mary; Radel, Clyde; Porter, Chris; Federoff, Howard J.
CS Department of Microbiology and Immunology, University of Rochester School of Medicine and Dentistry, 601 Elmwood Avenue, Rochester, NY, 14642, USA
SO Journal of Neuroscience Methods (1998), 80(2), 137-147

AB To develop a reproducible gene transfer method for the murine CNS we evaluated delivery of various gene vehicles using mech. or manual stereotaxic intracranial inoculation. A microprocessor based controlled microsyringe pump (The World Precision Instruments/UltraMicroPump) programmable for vol., rate and syringe size and designed to **dispense nanoliter** and picoliter vols. was compared to a std. manual deliver method. Gene transfer efficiency of two viral vectors, two synthetic cationic lipid mols., and naked DNA were evaluated in mice injected unilaterally in two brain regions. Animals received 1 μl over 10 min. of either HSVlac (1×105 b.f.u), AdLac (1×105 p.f.u), Tfx-10 or Tfx-20 (2.6 μg DNA in 2.0 μl Tfx; 1:1 charge ratio of DNA to liposome), or naked DNA (HSVlac plasmid, 10 μg/μl). After 4 days animals from each group were perfused and tissue prepd. for X-gal histochem. detection of β-galactosidase expression. Blue cells were obsd. in the HSV, Adenovirus, and Tfx-20 groups only at the injection site in animals injected using the UMP. Animals injected manually exhibited fewer blue cells and pos. cells were not restricted to the injection site. To quantify expression, tissue punches harvested from the injection sites as well as from other brain regions were analyzed using a chemiluminescent reporter assay to detect β-galactosidase (Galacto-Light). These data indicated increased activity in all animals injected with a lacZ contg. vector via the UMP as compared to manual delivery: A 41% increase in the expression levels of β-gal in HSVlac infected animals (p=0.0029); a 29% increase in Adlac infected animals (p=0.01); a 56% increase in Tfx-10 transduced animals (p=0.04); a 24% increase in Tfx-20 transduced animals (p=0.01); and a 69% increase in naked DNA gene transfer (p=0.05). Total β-galactosidase activity was greatest in HSVlac infected mice followed by Adlac>Tfx20>Tfx10=naked DNA.

L11 ANSWER 38 OF 229 CA COPYRIGHT 2003 ACS
AN 128:303451 CA
TI **Multi**-use pipets and **micropipets** for laboratory automation, automated analysis, and as microreactors and microfilters
IN Vetter, Dirk
PA Vetter, Dirk, Germany
SO PCT Int. Appl., 24 pp.
LA German
PI WO 9816312 A1 19980423 WO 1997-EP5696 19971015
PRAI DE 1996-19642777 19961016
AB A multi-use pipet suitable for lab. automation, esp. for a large no. of units related to miniaturization and parallelization of lab. processes, was developed which can filter absorbed liq., can act as a reactor for microchem., microbiol., or physicochem. reactions, and can measure out samples in the mL-to-sub-mL range size. The pipet was designed to have means for flow constriction, flow control, and liq. filtration built into the device.

L11 ANSWER 48 OF 229 CA COPYRIGHT 2003 ACS
AN 126:206960 CA
TI Fluorescence correlation spectroscopy (FCS) - a highly sensitive method to analyze drug/target interactions
AU Sterrer, Sylvia; Henco, Karsten
CS EVOTEC BioSystems GmbH, Hamburg, 22529, Germany
SO Journal of Receptor and Signal Transduction Research (1997), 17(1-3), 511-520
AB A review with 10 refs. Fluorescence Correlation Spectroscopy (FCS), a new anal. technol., allows binding properties to be detd. very accurately in biol. assays at the level of single mols. At concns. of ≥ 10-12 M, binding consts., on/off-rates, and even reaction/enzyme kinetics can be detd. in

real-time, and in sample vols. as low as 10-9 μl. The FCS technol. can be applied to study mol. and cellular interactions in homogeneous assays. Assay times in the range of seconds in combination with **nanoliter** sample vols. allow FCS to be used for high throughput screening to identify new pharmaceutical lead structures or new pharmacol. targets. FCS is fully compatible with std. microtiter plate formats. However, for high throughput screening, specially designed sample carriers contg. many thousand sub-**microliter** sample wells may be used in combination with a **nanopipetting** and sample retrieval system.

L11 ***ANSWER 53 OF 229*** CA COPYRIGHT 2003 ACS
AN 124:197329 CA
TI Precision 96-channel dispenser for microchemical techniques
AU Stanchfield, J.; Wright, D.; Hsu, S.; Lamsa, M.; Robbins, A.
CS Robbins Scientific, Sunnyvale, CA, 94086, USA
SO BioTechniques (1996), 20(2), 292-6
AB A new automated 96-channel **microdispenser** is described for precise, high-speed **dispensing** of **microliter** vols. of reagents. The Hydra-96 is a programmable instrument composed of 96 glass syringes arrayed in a microplate format that fills and dispenses in unison under computer control. The instrument has <2% coeff. of variation (CV) across the syringe array when dispensing between 0.5 and 20.0 μL of reagent. Blot hybridization studies demonstrate a simple rinsing protocol using 2% bleach that efficiently cleans the system of DNA without affecting subsequent PCRs. Current uses of the instrument in assembling microassays used in large-scale genetic mapping and sequencing projects and compd. library screening are discussed.

L11 ANSWER 110 OF 229 CA COPYRIGHT 2003 ACS
AN 106:148639 CA
TI Automatic manipulation of microliter volumes of liquid reagents
AU Martin, W. J.; Galinski, B. R.; Beck, M. S.
CS Inst. Sci. Technol., Univ. Manchester, Manchester, M60 1QD, UK
SO Journal of Physics E: Scientific Instruments (1987), 20(1), 22-6
AB An automatic reagent manipulating system (ARMS) for measuring, **dispensing**, and mixing **microliter** vols. of liq. reagents to react at ambient temps. is described, for use mainly in anal. in the life science lab. The necessary attributes of such a system are outlined and an account is provided of the ARMS components (a reagent handling device, a liq. dispenser, and a control module). The operation of the system is described and ref. is made to its use in automating the Sanger DNA sequencing reactions. The potential of the ARMS for use in other mol. biol. and biotechnol. lab. protocols is mentioned.

L11 ANSWER 113 OF 229 CA COPYRIGHT 2003 ACS
AN 106:63379 CA
TI Microplate phosphocellulose binding assay for aminoglycoside-modifying enzymes
AU Cooksey, Robert C.; Metchock, Beverly G.; Thornsberry, Clyde
CS Antimicrob. Invest. Branch, Cent. Infect. Dis., Atlanta, GA, 30333, USA
SO Antimicrobial Agents and Chemotherapy (1986), 30(6), 883-7
AB The phosphocellulose binding assay for aminoglycoside-modifying enzymes (AMEs) was modified by use of microdilution plates and a **multichannel micropipette**. Batteries of aminoglycoside substrates for screening organisms for the presence of AMEs as well as for subclassifying enzymes were prepd. and stored in microdilution plates. When tested in parallel with the conventional tube reaction assay, the microplate assay yielded comparable radioactive counts and therefore equally correct identifications

of AMEs in 32 isolates representing 9 bacterial species. Other modifications, such as multichannel dispensing of crude enzyme prepns. and radioisotopic precursors, provided a more rapid, convenient, and less expensive means of examg. large collections of organisms for AMEs.

L11 ANSWER 128 OF 229 CA COPYRIGHT 2003 ACS
AN 101:208738 CA
TI Microtiter radioimmunoprecipitation assay of HSV-1 polypeptides with recovery and SDS-PAGE analysis of precipitated proteins: usefulness as screening test for large numbers of specimens including hybridoma supernates
AU McKendall, Robert R.; Woo, Wayne
CS Dep. Neurol., VA Med. Cent., San Francisco, CA, USA
SO Journal of Immunological Methods (1984), 72(2), 461-9
AB Immunopptn. of radiolabeled polypeptides from complex mixts. of proteins was performed in polystyrene microtiter plates using staphylococcus protein A and various antibody prepns. The method is rapid, uses **multichannel micropipettor** technol., handles large nos. of specimens easily, requires very small vols. of antigen and antibody (5-50 μL), provides replicates for statistical anal., and allows recovery of pptd. proteins for direct SDS-polyacrylamide gel electrophoresis anal. of pptd. proteins. It is useful as a test to screen large nos. of sera or to characterize monoclonal antibody-contg. samples.

L11 ANSWER 153 OF 229 CA COPYRIGHT 2003 ACS
AN 95:38405 CA
TI Electrothermal atomic absorption spectrometric techniques for the determination of zinc and copper in **microliter** and submicroliter volumes of aqueous and serum matrixes
AU Levi, S.; Fortin, Richard C.; Purdy, William C.
CS Dep. Chem., McGill Univ., Montreal, QC, H3A 2K6, Can.
SO Analytica Chimica Acta (1981), 127, 103-8
AB Two electrothermal at. absorption techniques which provide linear working functions over wide concn. ranges and are suitable for the detn. of Zn and Cu in aq. and 10-fold dild. blood serum matrices are evaluated. The 1st technique is based on modification of the furnace tube to provide a decrease of the at. absorption signal when **microliter** and larger vols. of sample are injected. The 2nd technique involves a delivery system capable of **dispensing micro-** and submicroliter sample vols. to the furnace tube. The precision of the 2 techniques is about 98%.

L11 ANSWER 166 OF 229 CA COPYRIGHT 2003 ACS
AN 88:185493 CA
TI A computer-controlled **multichannel micropipetter**
AU Stahli, Christian; Wharton, John H.; Noll, Hans
CS Dep. Biochem. Mol. Biol., Northwestern Univ., Evanston, IL, USA
SO Analytical Biochemistry (1978), 86(1), 1-20
AB A **multichannel micropipetter** was developed capable of pipetting ≥1 μL with a reproducibility of >±2% and an accuracy of ±0.5%. The **micropipetter** consists of a precision **syringe** to which 13 individually valved fluid channels are connected as a bundle of segments spreading out radially from the tip of the syringe to pinch valves and further to fluid interfaces consisting of steel tubing sections for uptake or dispensing of fluid. A stepping motor drives the piston of the measuring syringe by means of a precision screw. Motor and valves are under computer control. Low dead vol. (internal vol. ~1μL/channel; external vol., 0.3 μL/cm of tubing), and the absence of internal valving parts ensure low cross-contamination (~0.1%). These features together with the versatility provided by the

large no. of independent channels and the automatic operation make the instrument suitable for pipetting multicomponent mixts. in the general biochem. lab. (for enzyme kinetics and complex reactions) as well as in specialized routine applications (clin. diagnostics and radioimmunoassay).

L11 ANSWER 172 OF 229 CA COPYRIGHT 2003 ACS
AN 84:132137 CA
TI General purpose **multichannel micro-dispensing** device
AU Kahl, Murray; Kaufman, Gerald I.; Wilt, John M.
CS Div. Lab. Res., New York State Dep. Health, Albany, NY, USA
SO Analytical Chemistry (1976), 48(4), 789-90
AB A continuously variable-vol. multichannel dispenser is described that permits rapid throughput, little waste, and great flexibility in dispensing small vols. of samples or reagents in a fixed pattern. The device consists of a frame on which is mounted a unit contg. a gear train and block-locating lever. Various syringe modules, filling blocks, slide-positioning blocks, etc. may be mounted on the frame as needed. The app. has 3 dispensing ranges: 1-8, 5-40, and 25-125 μl.

L11 ANSWER 187 OF 229 CA COPYRIGHT 2003 ACS
AN 77:83245 CA
TI Apparatus for dispensing small amounts of liquids
IN Lancaster, Jesse F.
PA Cooke Engineering Co.
SO Ger. Offen., 31 pp.
PI DE 2141360 19720323
PRAI US 1970-73505 19700918
AB A compact app. for sampling liqs. for anal. is described. Microamts. of sample soln. are taken reproducibly and simultaneously from the solvent reservoir with a multiple of pipets and are delivered simultaneously to wells arranged in a microtitrn. plate. The elec. and pneumatic control components are mounted as an integral part of the system on the basic frame.

L11 ANSWER 210 OF 229 CA COPYRIGHT 2003 ACS
AN 53:116990 CA
OREF 53:20926f-g
TI Servo-controlled **pipetter** for precise delivery of **microliter** drops
AU Kelley, M. T.; Hemphill, H. L.; Fisher, D. J.
CS Oak Ridge Natl. Lab., Oak Ridge, TN
SO U.S. At. Energy Comm. (1958), TID-7568(Pt. 2), 98-106
AB A servo-controlled, remotely operated pipetter has been designed for use as a component of app. for the detn. of d. of liquids by the falling drop method. The pipet operates as a pos. displacement device that is controlled by a Brown servo system. The relative standard deviation of delivery of 5-μl. drops is 0.2%.

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